DOCUMENT RESUME

ED 301 659 CE 051 380

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TITLE Cost-Effectiveness of Two Methods of Job Analysis.
PUB DATE 28 Nov 88
NOTE 25p.; Paper presented at the Annual Conference of the American Vocational Association (St. Louis, MO, December 1-5, 1988).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Cost Effectiveness; *Evaluation Methods; *Job Analysis; *Publishing Industry; Secondary Education; *Task Analysis; *Vocational Education
IDENTIFIERS *DACUM Process

ABSTRACT

A three-phase study was conducted to compare the cost-effectiveness of two methods for determining job profiles in the publishing business and book trade--the task inventory and the Developing a Curriculum (DACUM) process. In phases 1 and 2, the task inventory and DACUM approaches were used to identify future changes in the technology used in the publishing industry and the resultant changes in jobs in the industry. The task inventory and DACUM approaches were then compared in phase 3. Both methods realized their planned results. The DACUM process required less staff time (17.2 versus 47 days). Furthermore, the task inventory demanded research personnel who were unnecessary for the DACUM workshops. However, DACUM requires more money for accommodation and travel expenses. Although both methods achieved their goals, there were subtle differences between them. Both DACUM and the task inventory gave good overall pictures of the occupation. Yet DACUM made the new technology in the publishing occupations more visible. Moreover, the task inventory required more time and costs than did the DACUM method. Since efficiency is a key element of cost-effectiveness and since the the DACUM method proved to be the more efficient method, it can be considered more cost-effective than task analysis. (MN)

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Department of Education
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Ref. : TO.21.88.1056
Date: November 28, 1988

ED301659

COST-EFFECTIVENESS OF TWO METHODS OF JOB ANALYSIS

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December 1 - 5, 1988
St. Louis, Missouri

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1. ABSTRACT

This paper describes a comparative evaluation of two methods for determining job profiles in the publishing business and booktrade: a task inventory and DACUM. Both methods can be considered as job analysis. This evaluation refers to a cost-effectiveness analysis of these methods.

2. GENERAL INTRODUCTION

The occupational areas of publishing business and booktrade are confronted with new technology, influencing the tasks of employees in the sense of downgrading, upgrading and regrading (Spenner, 1985). The translation of these tasks into vocational education curricula presents a problem for the two educational institutes in this branch of industry.
The implications and consequences of new technology for this field has led to some questions by the educational institutes such as:

1. Which technological developments occur in the publishing business and booktrade?
2. Are the technological developments already manifest in the occupational areas?
3. Do educational curricula match with future developments?
4. In which way will graduates be confronted with (new) demands on the workfloor?

Update of existing educational programs depending on technological changes in the occupational area is the leading question. Besides this practical question we also wanted to answer a scientific question: which method of job analysis is most effective and efficient in the context of curriculum development? An important problem of existing methods in The Netherlands is their duration. The Department of Education and Science is interested in an efficient method for determining job profiles as a basis for developing vocational education curricula. Educational costs and values have to be well understood and systematically considered in formulating policy. The failure to measure costs and values could indicate carelessness in the use of public funds to attain educational goals in the society's interest and in the use of human time to promote individual welfare (Frazer, Walberg, Welch & Hattie, 1987).

The first phase of the research project was carried out from March 1987 till November 1987. We used a variety of information gathering techniques to determine which developments are essential for future changes in vocations:

a) a literature study of future developments, b) interviews (n=18 representatives of companies), c) a content analysis of existing curricula and d) a task inventory (n= 167 graduates).

In the second phase we used DACUM. DACUM or "Developing **A** Curricul**UM** " is an approach to occupational analysis. The product of DACUM is a profile chart of a job or an occupational area and can be used as basis for curriculum development (Norton, 1985). We have organized two DACUM workshops for the field of publishing business and booktrade. Both workshops led to job profiles (Hesse & Nijhof, 1988[b]).

In the third phase we evaluated two methods: the task inventory and the DACUM approach. Both methods lead to similar products: the translation of technical change to tasks of a job (Hesse & Nijhof, 1988[a]). We have evaluated the methods on effectiveness and efficiency.

3. THE DEFINITION OF TASK ANALYSIS

Before describing the design and results of the study we need to clarify the concepts task analysis, effectiveness and efficiency.

We used two methods of task analysis in the same branche. From various studies it is known (Carlisle, 1985; Gael, 1988) that there are a lot of methods of task analysis. The need for task analysis has long been recognized by educators. The first systematic analysis of an ongoing task was published by Taylor (1911). Other descriptions of task analysis are found in the activity analysis of Bobbit (1924) and Tyler (1934). Tyler emphasized the need for instructional objectives. Bloom (1956) agreed with the need for objectives and added that since all objectives were not unique, some methods of categorization should be possible. Gagné, Davies and others (Gagné, 1977; Davies, 1976) developed various categorization schemes and methods of analysis for deriving and structuring objectives.

Many authors write if a task analysis is specific to job training (Miller, 1976; Gael, 1983), only applicable for intellectual skill (Gagné, 1977), only as a systematic approach of training (Rummler, 1987) or only to dissect and examine educational aims (Pratt, 1983). This occurs because the techniques of analysis has been developed to fill a particular role which may be different for each analyst and which has most often been in the domain for training.

Concern with specialized techniques has lead to a variety of specialized definitions of the term task analysis in a range from a broad use " which includes setting of performance

criteria, break down of job tasks, to assess instructional goals" to a narrow definition "in which task analysis is only the breakdown of performance into detailed levels of specificity".

The term "task analysis" is an unfortunate term since description, analysis and synthesis are all involved (Davies, 1973). The term " task analysis" however is used extensively by those describing a particular form of analysis. Other terms are sometimes used to describe this type of analysis (job analysis, functional analysis, PAQ etc) but most methods use essentially the same process despite the type and function of task analysis. In many methods we find the following process definition of task analysis.

1. Break the task, content, etc. down into constituent elements.
2. Determine the relations among those elements.
3. Identify the underlying principle or optimal learning design and restructure in accordance with that principle.

Any method of analysis which includes all of these steps can be considered as a method of task analysis. If a method only describes tasks without consideration of all three steps, it is a sort of technique other than task analysis.

A lot of definitions don't include the conditions of the process definitions of task analysis. Gagné's (1970) technique of hierarchical analysis is an example. The hierarchical analysis is actually research analysis rather than task analysis since specifics about breaking the entire task down to develop learning material are not included.

Merril (1985) recommends a procedure involving job analysis, procedural path analysis and knowledge analysis. He calls this procedure a structured analysis. The structured analysis approach reveals the specific steps required to perform the task, the sequence in which those steps must be performed and the hierarchical relationships between the parts of the tasks.
Since there is much semantic confusion about the term task analysis it is better to group all methods which follow the process definition and use more precise terms to specify the different methods. The same has to been done for terms as occupation, job and job analysis.

In fact three types of task analysis can be distinguished. They include a topic analysis involving a detailed analysis of intellectual skills, a job analysis involving the analysis of physical or psychomotoric skills and a skill analysis which involves a analysis of psychomotor tasks. Although many methods of task analysis have been developed they have been used in isolation from each other. No attempts have been made to compare or combine analyses in the context of curriculum development.

4. EFFECTIVENESS AND EFFICIENCY

To measure the effectiveness and efficiency of the task inventory and DACUM an explanation of the terms effectiveness and efficiency is necessary. The terms effectiveness and efficiency are often used in management literature. Effectiveness in the educational situation is determined by the extent that the planned results are reached. Effectiveness can be expressed in the following formula:

$$\text{Effectiveness} = \frac{\text{the realized results}}{\text{the planned results (goals)}}$$

Effectiveness can only get values between zero and one.Efficiency is the ratio between results and costs . The costs are all sacrifices to reach the planned results. Efficiency can be formulized as follow:

$$\text{Efficiency} = \frac{\text{the realization of planned results}}{\text{the costs (money and time)}}$$

The term efficiency is not always usable. The realized results and costs can not always be made operational into a suitable measure of comparison. In our case the efficiency of methods with similar products will be compared.

Traditional experimental strategies to address effectiveness are well-estabished and therefore need no further elaboration. Current research integration methods, along with more scientically sound cost techniques, allow evaluation specialists to address the question "Is it worth it?

Yet, it doesn't make much sense to consider cost when the effectiveness of the method is yet to be established. After all, if an intervention doesn't work there is little reason to consider its costs (Niemiec & Baker, 1987).

5. RESEARCH DESIGN

The central question in this study is: "The comparison of the methods in view of their effects and efficiency?"

The task inventory in our project is primarily developed in the context of curriculum development. Before going any further let us clarify the concept task inventory. Gael (1983,4)

gives the following definition of task inventory. "A comprehensive list of tasks performed to accomplish a job or a set of jobs -a list that is cast in the form of a questionnaire." Goal of the task inventory is to analyze the tasks of a job or jobs.

Our task inventory consists of nine duties and seventy-one tasks including all the tasks of jobs in the publishing industry and booktrade area. The questionnaire was distributed to 167 school leavers of educational and training institutes. The school leavers rated the frequency and relative importance of each task. We received 83 completed questionnaires (50%). The data of the questionnaires were statistically analyzed by means of the cluster analysis method. The outcomes were statistical job profiles.

The second method was DACUM. The participants of the workshop are representatives of companies in the occupational area. Important criteria for the selection of committee members according to Norton (1982) are the following: technical competence (an expert in the field); full-time employment; occupational representatives; ability to communicate; ability to cooperate as a team member; free from bias relating to training methods, full-time commitment to the DACUM workshop. Instructors and teachers are not invited because they are not free from bias to training methods. In our project we have formulated the following group criteria: equally divided to geographical area, sex, age and size of business.

Two DACUM workshops were set up for the publishing industry and booktrade. The participants of each workshop (n = 9; n = 11) were asked to discuss the duties and tasks of the chosen occupation. The final task and duties were used to develop the DACUM chart.

Questionnaires on the DACUM workshop were answered by members of the workshop. The questionnaire consisted of questions about: personnel data, motives for participation in the workshop, the perception of the group process judgment of the DACUM procedure and the DACUM chart. Also the execution of the DACUM workshop was observed and recorded on videotape for further analysis of the group process. Both methods are depicted in figure 1.

method	information gathering techniques	results
1 task inventory	questionnaire (N=83)	cluster analysis publisher bookseller
2 DACUM workshops	introspection brainstorming	DACUM chart
- publishing-business	(N=9)	publisher
- booktrade	(N=11)	bookseller

Figure 1. Methods, information gathering techniques and results

We have applied a cost-effectiveness analysis for the evaluation of DACUM and the task inventory. The reason for using a cost-effectiveness analysis is that it relates the results with the costs. Cost-effectiveness analysis assumes that only methods with similar or identical goals can be compared and a common measure of effectiveness can be used to compare them. In our case we have fulfill both criteria.

The ingredient of resource method of Levin (1984) is used to calculate the costs of the methods. It involves detailing of every ingredient. The value of this method that it makes explicit what previously been only implied. It is therefore more scientific than other methods.

6. RESULTS

We will describe the results in view of the following questions.

1. **Is there a deviation between the planned and realized results of the methods?**
2. **Are there differences between the methods with regard to the spending of time and costs?**
3. **What is the relation between the spending of time and costs and the results?**

The first question concerns the effectiveness of the methods. The second refers to a comparison of time and costs of the methods. The last question concerns the efficiency of the methods.

6.1 The Effectiveness of the Methods

Both methods have realized their planned results. Since the methods of task analysis lead to similar products, we could compare the methods on the following criteria: a complete picture of the occupation, a complete picture with regard to the impact of new technology, identification of general areas, the specific translation of new technology into tasks (Hesse & Nijhof, 1988a).

A complete picture of the occupation

The DACUM charts (see appendix 1 and 2) and the cluster analysis (appendix 3a and 3b) give both a complete pictures of jobs in the booktrade and publishing industry.

A complete picture with regard to the impact of new technology

The DACUM method gives us a complete picture of the impact of new technology and in the way it is incorporated in tasks (appendix 1 and 2).

The cluster analysis doesn't give us a complete picture of the impact of new technology specific in case of the publishing jobs. The impact of new technology is conducted on only two general areas of the publisher, those being:"operating on software" and "programming in computer languages" (see appendix 4).

Identification of general areas (duties)

The general areas of DACUM-chart "publisher" emphasizes management (six areas) and new technology (five areas). The cluster analysis of the occupation "publisher" differs from the DACUM cart. It has only two areas in management and two areas in new technology(see figure 2).

The DACUM-chart "bookseller" emphasizes management areas (5 areas) while new technology is incorporated in the existing areas. The task inventory pays little attention to management (2 areas) and new technology in comparison with the DACUM chart.

General areas Publisher	DACUM	Task	General areas Bookseller	DACUM	Task
Management	6	2	Management	5	2
Editor. proces of publishing	1	1	Sell products	1	1
Production of publishing	1	1	Purchase products	1	1
Administration	-	2	Administration	-	2
New technology	2	2	Safety/security	1	1
			Window display dressing	-	1
Incorporat. of new technology (operating on software and modern media)	3	-	Incorporat. of new technology	4	-

Figure 2. General areas of DACUM and the task inventory

The specific translation of new technology into tasks

In the DACUM chart "publisher" the tasks of the general areas "new technology as tool for the process of publishing" and "the relationship of new technology with publications " have now become part of the occupation. The impact of new technology in the DACUM-chart is particularly incorporated in the tasks of the duties of "editorial realization of publishing plans","technical realization of publishing plans" (the production) and "selling of publishing plans" (publications) (see appendix 1, DACUM chart, "publisher")

The cluster analysis involves the impact of new technology with regard to the following duties: to operate on software and to program in computer languages. The DACUM chart "bookseller" is the only product in which new technology is translated into tasks of the following duties: purchase products, sell products , draw up an information plan and assess a safety plan (see appendix 2).

To put it briefly: Dacum and the task inventory give both complete picture of the occupation. Yet DACUM makes new technology in tasks of the occupation more explicit.

The DACUM chart

The quality of the DACUM chart will also be determined by the the perception of DACUM participants besides other influencing factors. We used a questionnaire to get information about the perception of the DACUM chart. We asked the DACUM participants (n = 20) after

the DACUM workschop about their opinion concerning the completeness of DACUM chart resp. duties and tasks and the inclusion of all technological developments. All participants stated that the DACUM chart covers all duties and tasks of jobs in the publishing industry and booktrade. The DACUM participants shared the opinion that all future developments are included in the DACUM chart.

6.2 A Comparison of Time and Costs

The second question concerns the differences between the methods with regards to the spending of time and costs. Since we have performed two DACUM workshops and one task inventory, we have divided the costs and time of the workshops by two. An overview of the time used by the personnel gives table 2. First we will discuss the data of each method, subsequently the two methods will be compared (see table 1).

The spending of time

Although one DACUM workshop has a duration of two days, the arrangements before and after the workshop take up time of the supervisor, the coordinator, the chairman and the assistants. Arrangements before and after the workshop in our case concerned:

- The supervisor and coordinator discuss with the representatives of educational institutes the participants for DACUM workshop, decisions about the occupational areas to be analyzed and the establishing of dates for the DACUM workshop.
- The supervisor and coordinator discuss with the chairman about the performance of the workshops.
- The coordinator and research assistants invite the DACUM participants for the DACUM workshop.
- The coordinator and research assistants make arrangements concerning the meeting room of the DACUM workshop, the reservations of hotel rooms and meals.
- The coordinator develops an agenda for the workshop and a planning scheme for the chairman.
- The chairman studies the DACUM handbook and literature of the booktrade and publishing business
- After the workshop the coordinator edits the tasks of the DACUM chart. At least the clerical personnel adds the finishing touch to the DACUM chart.

The task inventory demands a lot of time of the researcher (30 working days) and research assistants (12 working days). The main issues of task inventory are the development of a questionnaire and the statistical processing of the data.

DACUM consumes in comparison with the task inventory less time of personnel (17.2-47 days). Furthermore the task inventory demands research personnel which is not necessary for DACUM.

Table 1. The spending of time by the methods expressed in an eight-hour working days .

	DACUM	Task inventory
1. Supervisor	1	1
2. Chairman	3	==
3. Coordinator	5	==
4. Researcher	==	30
5. Research assistants	6	12
6. Clerical personnel	2	4
Total	17.2	47

The spending of costs

The costs of the methods consist of six ingredients: personnel, office supplies and materials, accommodation and travel costs, data processing, postage and facilities. The total costs represent the value of all ingredients required for the method. The total costs are the cost for replicating the method. The distribution of costs is graphically depicted in table 2.

DACUM spends more money on accommodation and travel costs. The accommodation and travel costs of the two workshops are specified in appendix 5. In case of the task inventory a lot money is spent on the salaries (gross) of personnel

Table 2. The costs of the methods calculated in dollars (exchange rate of 1 november: 1 dollar = 2.04 Dfl)

	DACUM	Task inventory
1. Personnel costs	$912	$3462
2. Office supplies and materials	6	225
3. Accommodation and travel costs (workshop)	1255	145
4. Data processing	==	150
5. Postage	12	340
6. Facilities (building) (office room, energy maintenance)	125	420
Total	$2310	$4742

6.3 The Efficiency of the Methods

Closely allied to the effectiveness is the efficiency of the methods. Although both methods have reached their goals, their results show subtle distinctions. DACUM and the task inventory give good overall picture of the occupation. Yet DACUM makes new technology in tasks of the occupation more visible. Moreover the comparison of both methods show that the task inventory requires more time and costs then the DACUM method (see table 3).

Table 3. Time and costs of the methods

	DACUM	Task inventory
Time	17.2	47
Costs (gross)	$2310	$4742

7. CONCLUSION AND DISCUSSION

The results of both methods can be used to design a curriculum , on condition that dimensions of educational psychology, pedagogic and industrial psychology will be included. Yet the product ought to be adjusted in future, dependent on the extent of new developments in publishing business and booktrade.

The results of this cost-effectiveness study show that a lot of factors influence the costs of a method. These factors are personnel costs, office supplies and materials, accomodation and travel costs, data processing, postage and facilities. Yet the factors "salaries and accommodation and travel costs" consume a great part of the budget. Although both methods have reached their planned results, DACUM is compared with the task inventory more efficient.

The current quantity and quality of research on the cost-effectiveness of educational issues is low. It is evident that even though there has been a proliferation of writings in the cost-effectiveness of education issues there has been little research on the subject (Caffarella, 1975).

Why should an administrator or policymaker be concerned with the results of cost-effectiveness analysis? The answer to this question is often that reference to such an analysis is an important source to persuade opponents.

Yet cost-effectiveness analysis can also lead to a more efficient use of educational resources: it can reduce the cost of reaching particular objectives and it can expand what can be accomplished for any particular budget.

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APPENDIX 1

DACUM chart "PUBLISHER"

FORMULATE A PUBLISHING STRATEGY	**A1. Analyze the strengths/ weaknesses of the organization**	**A2. Analyze market and competitors**	**A3. Decide the desirability of empirical research**	**A4. Introduce an research plan**	**A5. Perform a research**	**A6. Formulate conclusions**	**A7. Make decisions**		
DRAW UP A LONG RANGE PLAN	B1. Gather existing plans	B2. Analyze strengths-weaknesses of the internal environment of the organization	B3. Analyze the market (the external environment of the organization)	B4. Choose a share of the market	B5. Orient on technical developments	B6. Establish priorities of product development	B7. Formulate the chances of derivative products	B8. Choose a product assortment	B9. Formulate start points for sale and distribution
	B10. Estimate the facilities	B11. Draw up a long range investment plan	B12. Draw up a long range budget	B13. Draw up a long range policy plan					
DRAW UP A BUDGET	C1. Draw up a publishing plan for each project	C2. Make an inventory of additional copies and reprints	C3. Draw up a publishing plan	C4. Estimate the profits of the old and new publisher's list in the coming year	C5. Draw up a sales plan	C6. Draw up a promotion plan	C7. Give an estimate of the costs	C8. Discuss the budget	C9. Determine the exploitation budget
	C10. Plan the facilities								
DRAW UP A PUBLISHING PLAN FOR EACH PRODUCT	D1. Perform a market analysis	D2. Describe the content and form	D3. Estimate the sales	D4. Analyze derived market possibilities	D5. Invite quotations for coproductions	D6. Draw up a pre-production costing	D7. Inquire financial aids/ support	D8. Decide to publish	D9. Acquisition of a manuscript
	D10. Instruct an author	D11. Assess the date of publication	D12. Draw up a marketing plan						
EDITORIAL REALIZATION OF PUBLISHING PLANS	E1. Draw up an contract of an author	E2. Judge a manuscript	E3. Discuss the manuscript with the author	E4. Accept the manuscript	E5. Translate the manuscript (if necessary)	E6. Reformulate the manuscript	E7. Perform a display-editing	E8. Determine the title	E9. Apply for codes (ISBN,NUGI)
	E10. Design the cover	E11. Perform the lay-out and typographic	E12. Settle internal administration formalities	E13. Input of data in royalty administration	E14. Control the productions				
TECHNICAL REALIZATION OF PUBLISHING PLANS	F1. Draw up a production plan	F2. Prepare the copy for the press	F3. Perform composing instructions	F4. Invite offers	F5. Draw up a calculation of the cost price	F6. Place an order for an composing shop	F7. Place an order for an lithographer	F8. Place an order for an audio-visual producer	F9. Correct the proof
	F10. Determine the edition	F11. Order paper and non-book materials	F12. Place an order for an printer	F13. Place an order for an binder	F14. Control the quality				
COMMERCIAL REALIZATION OF PUBLISHING PLANS	G1. Perform a definite calculation	G2. Determine the selling price	G3. Test the offer statistics	G4. Approach the non-traditional distribution networks	G5. Perform a dummy	G6. Write a cover text	G7. Instruct sales representatives	G8. Develop promotion materials	G9. Instruct the distributioncentre
	G10. Make contact with press and publicity media	G11. Spread out of review copies	G12. Advertise	G13. Spread out copies of judgment	G14. Decide at additional copies				
EXPLOITATION OF COPY RIGHTS	H1. Foreign sales	H2. Deal with applications of license	H3. Administrate compulsory license	H4. Inform foreign publishers	H5. Sale copyright in behalf of audio-visual productions	H6. Invite calculations of coproductions	H7. Draw up a license contract	H8. Inform the royalty administration	
MANAGE THE AUTHORS	I1. Search new authors	I2. Support authors	I3. Maintain relations with authors	I4. Transfer royalties	I5. Keep up date with the authors contract archives	I6. Inform the authors of the exploitation of copyrights	I7. Send reviewers of edits to authors	I8. Public relation activities in behalf of authors	I9. Present authors copy to the readers
NEW TECHNOLOGY AS TOOL FOR THE PROCESS OF PUBLISHING	J1. Employ the personal computer	J2. Employ software	J3. Wordprocessing in behalf of sales letters, catalog and instruction	J4. Database products - addresses of public - readers customers - addresses of authors	J5. Aquisition of management information with the assistance of the computer	J6. Database in behalf of planning	J7. Employ the personal computer in behalf of calculation, marketing and the production plan	J8. Technical drawing on the personal computer	J9. Automatize the editorial section
THE RELATIONSHIP OF NEW TECHNOLOGY WITH REGARD TO PUBLICATIONS	K1. Orient on means of communication	K2. Determine the consequences for editorial staff, production and commerce	K3. Acquisition of technical possibilities and restrictions	K4. Acquisition of knowledge on distribution and marketing in behalf of the modern media	K5. Exploit databases				

The marked tasks are influenced by new technology

APPENDIX 2

DACUM chart "BOOKSELLER".

ASSESS THE ORGANIZATIONAL POLICY	**A1.** Perform market research with regard to determine the location of the business	**A2.** Consult an advisory body with regard to determine the location of the business	A3. Determine the financial conditions of the organization	A4. Draw up a long-range plan	A5. Draw up a budget	**A6.** Determine the assortment	A7. Choose the place of business	A8. Arrange the financing
	A9. Determine the influence of city legislation on the organization	A10. Evaluate the organizational plan	A11. Determine de organizational structure	A12. Determine the legal form of a organizationproduct				
MANAGE THE ORGANIZATION	B1. Coordinate works	B2. Anticipate on future developments	B3. Supervise personnel	B4. Control plans and budgets	B5. Evaluate organizational policy on a continuing basis	B6. Adjust organizational policy	B7. Join a pressure group (interest group)	B8. Apply the Regulations of the Dutch Booktrade
	B9. Maintain external contacts	B10. Keep informed about on new markets and products						
ASSESS SOCIAL POLICY	C1 Apply labour conditions	C2. Recruit and select employees	C3. Stimulate personnel to follow educational training	C4. Determine job description	C5. Discuss the progress of works	C6. Maintain a tasks evaluation	C7. Plan the career of employees	
ASSESS MARKETING POLICY	D1. Draw up a marketing outline	D2. Assess publicity/ promotion plans	D3. Select the company logo	D4. Establish the organization	D5. Report social and economical developments			
PURCHASE	E1. Assess the purchasing policy	E2. Select new titles for the book exhibition	E3. Assess conditions of purchasing	E4. Translate the purchasing policy to salesman	E5. Form a collection of books	E6. Control the rubrics	E7. Determine the ordering techniques	E8. Select a supplier
	E9. Handle customers wishes	E10. Visit an exhibition and importers	E11. Receive sales representatives	E12. Receive information about display from the publishers	E13. Identify trends in publications	E14. Become acquainted with the customers	E15 Test new products	E16. Anticipate on seasonal influences
SELL	F1. Draw up a sales plan	F2. Support the sales	F3. train employees to use new sales approaches (methods)	F4. Keep a sales talk	F5. Control the supplies	F6. Bargain for the best price	F7. Visit customers	F8. Perform a search procedure
	F9. Be acquainted with the products	F10. Reduce the price of the books	F11. Place customer orders	F12. Keep the shop in order	F13. Carry out a promotion	F14. Sell at different locations		
DRAW UP AN INFORMATION PLAN	**G1.** Organize an administration	G2. Determine the purchase of tools	**G3.** Organize and control the processing of goods	**G4.** Assess the informational needs	**G5.** Return books	**G6.** Organize customers orders	**G7.** Gather data	**G8.** Process data
	G9. Analyze the results							
ASSESS A SAFETY PLAN	H1. Consult experts	H2. Instruct employees	H3. Consider out the purchase of a safety/security devices	H4. Consult colleagues	H5. Carry out safety exercises	H6. Maintain house rules	H7. Control administrative risks	H8. Handle shoplifting
	H9. Do the lay out of the shop	H10 Give first aid						

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T.I. The marked tasks are influenced by new technology

Appendix 3a

CLUSTER 1: RUN A BUSINESS
1. Draw up a long range policy plan
2. Control the budget
3. Draw up plans
4. Draw up budgets
5. Control plans
6. Draw up periodic costs and profits
7. Use of sale techniques

CLUSTER 2: MARKETING
1. Formulate orders for market research
2. Perform market research
3. Translate data of research into products
4. Formulate a prognosis for sale
5. Perform a plan for an information product
6. Develop a sales promotion plan
7. Draw up a plan for an information product

CLUSTER 3: DRAW UP A PROMOTION PLAN
1. Draw up an advertise/promotion plan
2. Organize an advertise/promotion plan
3. Write advertising texts

CLUSTER 4: PROGRAM IN COMPUTER LANGUAGES
1. Develop computer software
2. Use data banks
3. Discuss with market researchers

CLUSTER 5: EDIT TEXTS
1. Correct manuscripts
2. Judge manuscripts

CLUSTER 6: OPERATE ON SOFTWARE
1. Employ graphical software
2. Employ calculation software
3. Operate peripheral equipment
4. Employ word processing software

CLUSTER 7: PERFORM EASY ADMINISTRATIVE WORKS
1. Carry out type activities
2. Keep up correspondence
3. Carry out countings
4. Control coutings

CLUSTER 8: ORGANIZE BILLS
1. Register bills
2. Control bills
3. Put the bills into the archives
4. Control orders

CLUSTER 9: WINDOW DRESSING

1. Draw up a plan for the shopping window
2. Select products for the shopping window
3. Dress a shopping window

CLUSTER 10: PREVENTION OF SHOP LIFTING

1. Detain suspected customers
2. Call the police

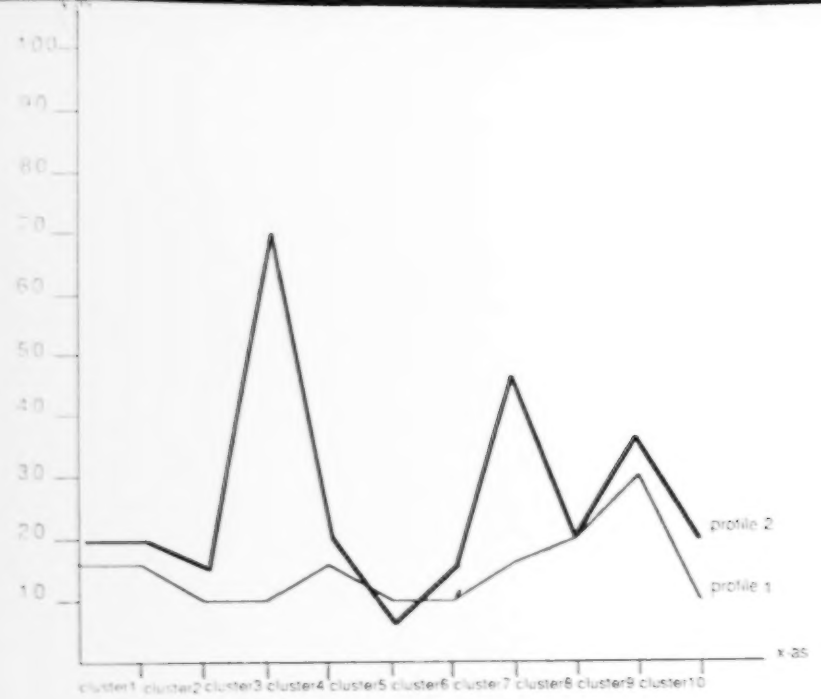

Figure a. The mean scores of two groups of respondents working in booktrade on clusters of tasks (profile 1, N = 16; profile 2, N = 14)[1]

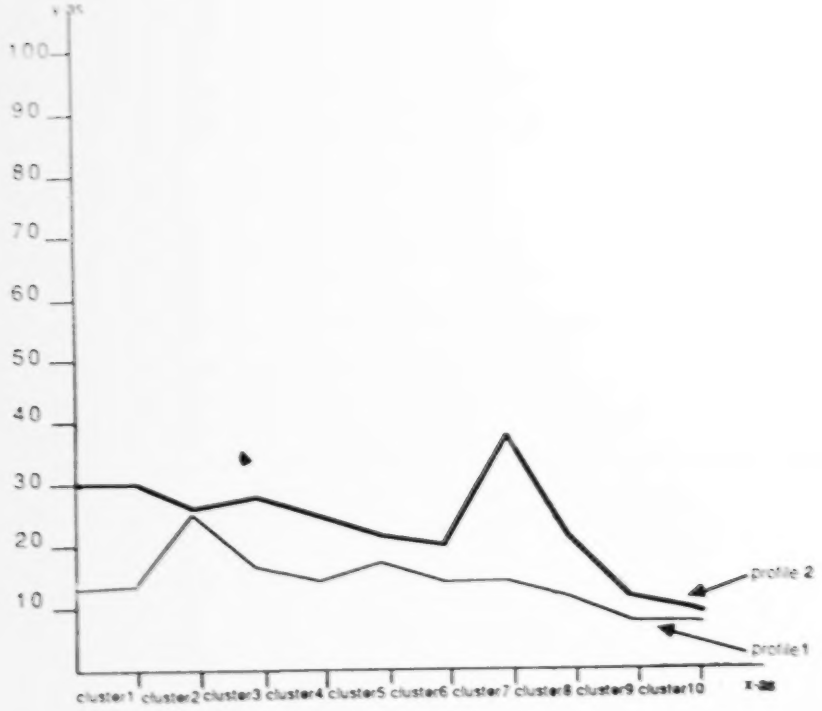

Figure b. The mean scores of two groups of respondents working in the publishing business on clusters of tasks (profile 1, N =11; profile 2, N = 12)

1 cluster 1: Run a business
cluster 2: Marketing
cluster 3: Draw up a promotion plan
cluster 4: Program in computer languages
cluster 5: Edit texts
cluster 6: Operate on software
cluster 7: Perform easy administative works
cluster 8: Organize bills
cluster 9: Window dressing
cluster 10: Prevention of shop lifting

Appendix 4

	PUBLISHER General areas DACUM chart	PUBLISHER General areas cluster analysis
Management	1. Formulate a publishing strategy 2. Draw up a long range plan 3. Draw up a budget 4. Draw up a publishing plan for each product 5. Exploitation of copy right 6. Manage the authors	1. Run a business or industry 2. Draw up a promotion plan
The editorial process of publishing	7. Editorial realization of publishing plans	3. Edit texts
The production process of publishing	8. technical realization of publishing plans	———
The selling of the publisher's list (publications)	9. The commercial realization of the publishing plan	4. Marketing
Administration		7.Organize bills 8.Perform easy administrative works
New technology	Specific duties: 10. New technology as tool for the process of publish 11.The relationship of new technology with the publications The incorporation of operating on software and modern media particularly: E. Editorial realization of publishing plans F. Technical realization of publishing plans G. Commercial realization of publishing plans (see appendix 1 DACUM-chart publisher)	5. Operate on software 6. Program in computer languages

Appendix 5

A formula of computing the costs of DACUM (two workshops)

Item	Planned costs	Realized Costs
Travel and accomodation expenses **Workshop publisher** **15/16 December 1987**		
Hotelcosts	bed and breakfast one night $38 10 participants $380	$420
Travelcosts	travelcosts round trip ten participant 500 dollar	=====
Lunch	participants and supporting personnel (16 persons) Lunch $6 Two days $192 dollar	$206
Dinner	Dinner $12 Two days = 384 dollars	$445
Total	$1456	$1069
Travel and accomodation expenses **Workshop bookseller** **5/6 January 1988**		
Hotelcosts	bed and breakfast one night $40 10 participants $400	$418
Travel costs	travel costs round trip ten participants $500	$292
Lunch	participants and supporting personnel (17 persons) Lunch $6 Two days 204 dollar	$218
Dinners	Diner 12 dollar 17 x 12 dollar= $204 Two days = 408 dollars	$465
Unexpected costs Drinks in restaurant		$48
Total	$1512	$1441

The accomodation and travel costs of two workshops are $2510. The mean costs of two workshops is $1255